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Abstract

EXPERIMENTAL METHODS OF REACTOR PHYSICS

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This paper is a synthesis of various experimental methods in use with the reactors of the Commissariat à l'Energie Atomique.

The main techniques used are mentioned and the difficulties encountered and the accuracy obtained are particularly dwelt upon. The application of these various methods to reactors in order to obtain specific results is also indicated. This paper consists of five parts.

I - General methods (J. CHEROT, B. SAUTIEZ)

Macroscopic and microscopic flux distribution (anisotropy effect), power distribution, etc ...

II - Kinetic measurements (J. LALANDE, M. SAGOT)

a) pulsed neutron technique : apparatus and accuracy ; application to λ_t and to antireactivity measurements ; application to graphite, light water and beryllium oxide.

b) oscillation techniques (R. VIDAL) : equipment and accuracy ; application to the measurements of effective cross sections and resonance integrals.

c) fluctuations : apparatus and technique of measurement.

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III - Poison methods (J. BAILLY, Y. GIRARD, P. LOURME)

Description of methods for introducing and extracting the poison, difficulties encountered with light and heavy water, measurement of temperature coefficients and anti-reactivity.

IV - Spectra measurements (C. CLOUET d'ORVAL, P. DELATTRE)

Choice and development of foils, problems of measurement, application to spectral measurements for thermalization studies, application to dosimetry.

V - Experimental shielding measurements (J. BRISBOIS, M. LOTT, J. RASTOIN)

The technique and apparatus recently developed in this field are presented.